

NGSS Grade 7 Standards Conceptual Flow Map

*conceptual flow map is a working draft and subject to revisions throughout the year

Unit/Estimated Dates	Phenomena/ Topic	Standards
<p style="text-align: center;">Unit 1</p> <h1 style="text-align: center;">Organisms and Nonliving Things are Made of Atoms</h1> <p style="text-align: center;">Dates Aug-Sep</p>	<ul style="list-style-type: none"> ● Competition in Ecosystems ● Organism Interactions in Ecosystems ● Human Dependence on Natural Resources ● Structure of Matter ● Changes in Energy on the Molecular Level ● Heat and Matter 	<p>MS-LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.</p> <p>MS-LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.</p> <p>MS-ESS3-1: Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes.</p> <p>MS-PS1-1: The student is expected to develop models to describe the atomic composition of simple molecules and extended structures.</p> <p>MS-PS1-4: Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.</p> <p>MS-PS1-4: Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.</p>

Unit 2

Matter Cycles and Energy Flows through Organisms and Rocks

Dates

Oct-Nov

- Characteristics of Chemical Reactions
- Physical and Chemical Properties
- Modeling Conservation of Mass
- Thermal Energy in Chemical Reactions
- Introduction to Photosynthesis
- Energy Flow in Organisms
- Earth Materials

MS-PS1-2: Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

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MS-PS1-5: Develop and use a model to describe how the total number of atoms does not change in a chemical reaction, and thus mass is conserved.

MS-PS1-6: Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.

MS-ETS1-3: Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ETS1-4: Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

MS-LS1-6: Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.

MS-LS1-7: Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.

MS-ESS2-1: Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

Unit 3

- Relationships in Ecosystems

MS-LS2-2: Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

Natural Processes and Human Activities Shape Earth's Resources and Ecosystems

Dates
Dec-Feb

- Flow of Energy in Ecosystems
- Plate Tectonics
- Seafloor Spreading
- Organism Interactions in Ecosystems (mentioned)
- Competition in Ecosystems (mentioned)
- Human Dependence on Natural Resources (mentioned)
- Characteristics of Chemical Reactions (mentioned)
- Modeling Conservation of Mass (mentioned)

MS-LS2-3: Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

MS-ESS2-3: Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

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MS-ESS3-1: Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

MS-PS1-2: Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

MS-PS1-5: Develop and use a model to describe how the total number of atoms does not change in a chemical reaction, and thus mass is conserved.

Unit 4 Sustaining

- Dynamic Nature of Ecosystems
- Ecosystem Biodiversity
- Geoscience Processes

MS-LS2-4: Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

MS-LS2-5: Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

Biodiversity and Ecosystem Services in a Changing World

Dates
Mar-Jun

- Weathering and Erosion
- Natural Hazard Predictions
- Synthetic Materials

MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3: Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ESS2-2: Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

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MS-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

MS-PS1-3: Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.